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(54) Title: **IMPROVED METALWORKING AND MACHINING FLUIDS**

(57) Abstract: Improved boron-based metal working and machining fluids. Boric acid and boron-based additives that, when mixed with certain carrier fluids, such as water, cellulose and/or cellulose derivatives, polyhydric alcohol, polyalkylene glycol, polyvinyl alcohol, starch, dextrin, in solid and/or solvated forms result in improved metalworking and machining of metallic work pieces. Fluids manufactured with boric acid or boron-based additives effectively reduce friction, prevent galling and severe wear problems on cutting and forming tools.

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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/33728

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C10M 173/00, 125/26

US CL : 508/185

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 508/185

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
EAST

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2,578,585 A (OROZEO et al.) 11 December 1951, see entire document.	1-11, 13-22
X	US 4,257,902 A (SINGER) 24 March 1981, see entire document.	1-22
X	US 5,468,401 A (LUM et al.) 21 November 1995, column 8, lines 18-35.	23
Y	US 5,507,962 A (JAHANMIR et al.) 16 April 1996, see entire document.	1-22
X	US 5,512,191 A (KRUEGER) 30 April 1996, see entire document.	1-22
X	US 5,547,595 A (HACIAS) 20 August 1996, see entire document.	1-11, 13-22
X	US 6,194,357 B1 (MURATA et al.) 27 February 2001, see entire document.	1-11, 13-22

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